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# (12) UK Patent Application (19) GB (11) 2 140 765 A

(43) Application published 5 Dec 1984

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(21) Application No 8315222

(22) Date of filing 3 Jun 1983

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(51) INT CL<sup>3</sup>  
B65B 25/14

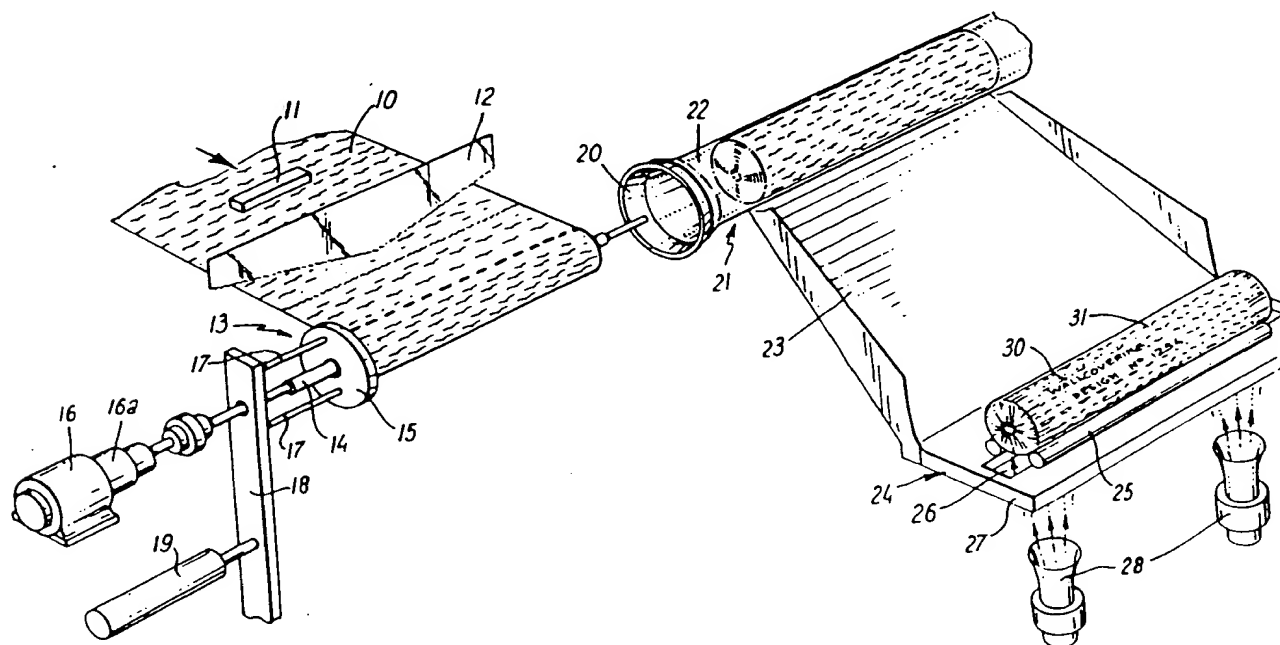
(52) Domestic classification  
B8C U19  
U1S 1219 1585 1593 B8C

(56) Documents cited  
None

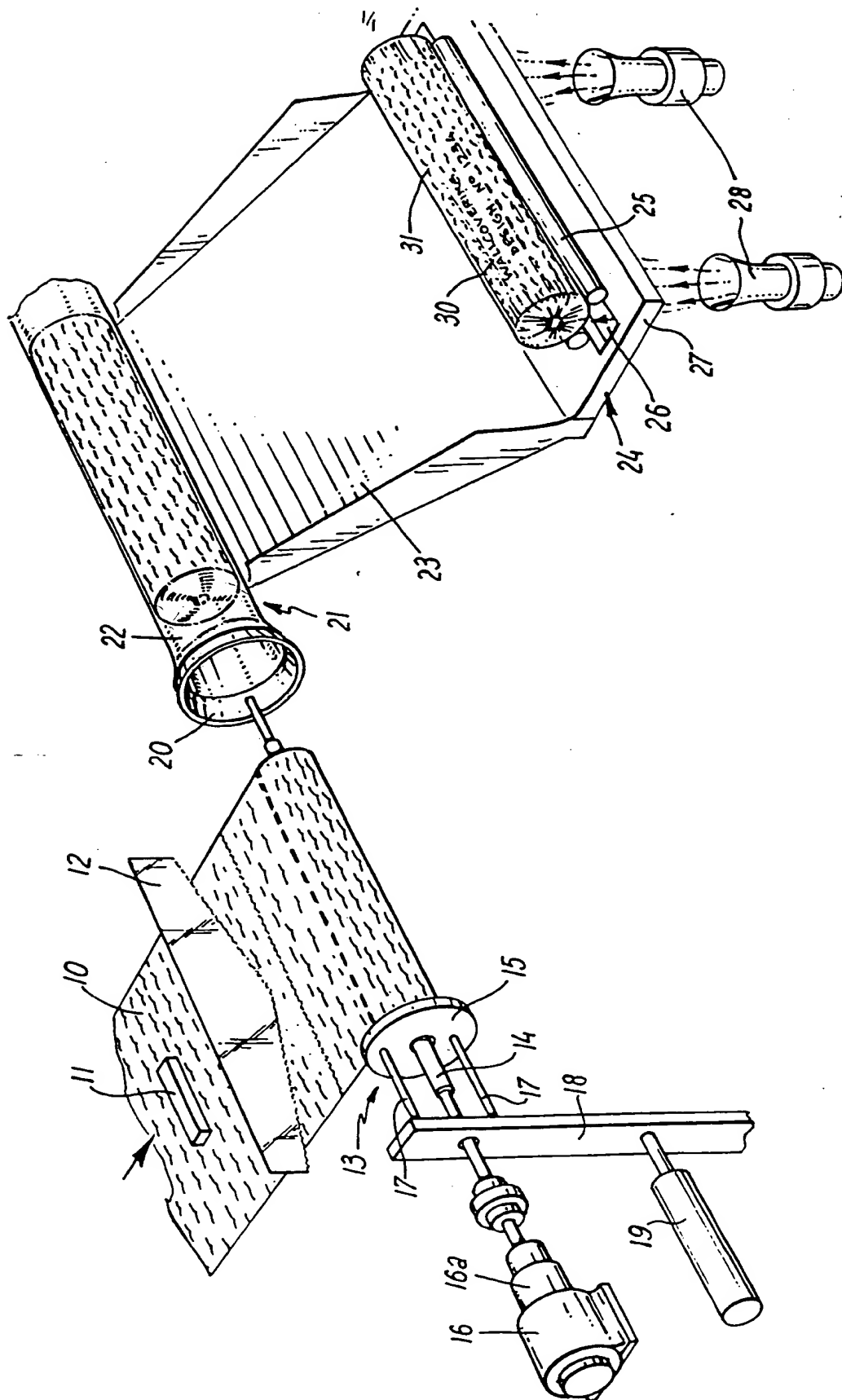
(58) Field of search  
B8C

## (54) Piece winding and packaging webs

(57) Web 10, such as wall and ceiling covering materials having a pronounced relief surface, is piece wound at a winding station 13 and then inserted into an oversize transparent plastics packaging tube 22 and reverse wound to fill the tube. The packaging tube 22 may have overlapping ends which are heated at a sealing station 24 by heat guns 28 to shrink close the tube over the ends of the wound piece. The tube is preferably preprinted 30 with identification marks and use instructions.



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## SPECIFICATION

## Piece winding

5 This invention relates to piece winding and it is mainly concerned with the problems arising from piece winding wall and ceiling covering materials having a pronounced relief surface. Such materials are conveniently hereinafter referred to as "Relief Wallcoverings".

10 Current practice for winding and presenting relief wallcovering comprises winding a web under controlled tension (such that any compression creep damage arising from the winding is tolerable) to form a roll; and presenting the roll in a wound polyethylene wrapping with a loose identifying/instructing label. This technique is employed for any wallcovering or other material that may be damaged in the rolling and wrapping process.

15 A number of disadvantages are now seen with this practice. First, compression creep damage can be variable and, in any event, it is preferred if it can be reduced. Roll diameters vary in size according to the depth of relief. This requires either a wide variety of packaging containers or, alternatively, the use of a smaller variety of containers with fillers and packings which add an undesirable cost and labour element. The seam of a wound polyethylene wrapping is a potential source of weakness and, should the seam fail, the product can become soiled and not saleable. The use of a loose label is untidy. If it is small it finds no regular location or orientation in the wrapping and, if it is large, then it covers the content of the packaged roll which should display itself as fully as possible through the wrapping. If a label is omitted then identification and instruction is lost.

20 The above problems have received due consideration in the present invention in which relief wallcoverings are piece wound; located in clear plastic tubing which may be printed; mechanically agitated so that the wound piece increases in diameter to fill the plastic tubing; and sealed in the tubing.

25 The preferred mechanical agitation is reverse winding. An alternative agitation can be derived from vibration.

30 Increasing the diameter after winding ensures that compression creep damage is reduced as there is a degree of uncoiling. Roll diameters are now all of a one size (or of a limited number of predetermined acceptable sizes) and hence pre-printed clear tubing can be used for all, or a large range of, products. The fact that the tubing is clear allows impressive, informative and full roll length pre-printing which does not obscure the product as the printing lies on a transparent base. The tubing has no noticeable points of weakness and can accept robust handling. Roll diameters can be the same for a wide range of products and hence packaging problems and costs are re-

duc d.

One form of the invention will now be described with reference to the accompanying drawing which is a perspective view of apparatus for carrying out the invention.

70 A continuous web 10 of wall covering passes under a measuring head 11 and a knife 12 to enter a piece winding station 13 comprising a reeling bar 14 and end guide 15. The reeling bar is driven by a motor 16 through a variable speed and reversible drive 16a. The end guide has connected to it a pair of arms 17 which are mounted on a vertical bar 18 which can be oscillated in a horizontal direction by a piston/cylinder 19. The bar 14 is shown supporting a wound piece WP.

80 On the same axis as the bar 14 there is a guide cone 20 of a packaging station 21 which has associated with it a supply of clear plastic tubing 22. It is arranged that, as the web 10 is being reeled at the station 13, the open end of a length of the tubing 22 is applied to the cone 20 at the packaging station 21.

90 A runway 23 connects between the packaging station and a sealing station 24.

The sealing station has a pair of driven rollers 25 operating on both sides of a slit 26 in a base 27. Below the base 27 there are a pair of heat guns 28 spaced apart so as to act through the slit 26 at the ends of a package reel of wallcovering 10.

100 In use, the piece winding operation at the winding station 13 is customary. A web length 10 is wound on to the bar 14 until a length measured by the head 11 is wound, the winding is braked, and the knife 12 operated to leave the wound piece WP on the bar. At the end of winding the cylinder 19 is powered and the vertical bar 18, arms 17, winding bar 14, end guide 15 and wound piece enter the cone 20 and the tubing 22. At this point the winding bar 14 is given reverse rotation to cause the wound piece to increase in diameter to fill the tubing 22. (It is to be observed that the wound piece on the bar 14 is of smaller diameter than the wound piece in the tubing 22.) The winding bar 14 and its associated parts are then withdrawn from the tubing 22, the tubing is pulled back from the cone 20 and the wound and tubing-packed length of wallcovering is allowed to roll along the runway 27 and take up position on the rollers 25 above the slit 26. At this point the ends of the tubing are open. The heat guns are then operated to heat close the open ends of the tubing over the ends of the packed length of wallcovering. A complete end seal is not essential.

125 Typical informative printing 30 is shown on the tubing 22 which does not seriously obscure the pattern 31 of the wallcovering. The printing can provide both identification and use instructions.

## CLAIMS

1. A method of piece winding and packaging comprising the steps of inserting a wound piece into a packaging tube of larger diameter than that of the piece, mechanically agitating the piece so that it increases in diameter to fill the tube, and closing the tube.
2. A method according to claim 1 in which the mechanical agitation is obtained by reverse winding.
3. A method according to claim 1 in which the wound piece is a wall or ceiling covering having a pronounced relief surface and the tube is a clear plastics tube which is longer than the wound piece so that it overlaps the wound piece at both ends.
4. A method according to claim 3 in which the closing of the tube is obtained by heat shrinking of the end overlap.
5. Apparatus for piece winding and packaging according to claim 1 comprising a piece winding station (13), a packaging station having means for offering a packaging tube length (22) to receive the wound piece (WP), means (16) for applying an unwind action to the wound piece in the tube length, and means (28) to close the tube length.
6. Apparatus as claimed in claim 5 in which the means to close the tube length comprises heat guns.
7. Apparatus as claimed in claim 5 or 6 in which the tube length is one of clear plastics material having printing thereon which does not obscure the packaged piece.
8. Apparatus according to claim 5 substantially as hereinbefore described.
9. A packaged length of wall or ceiling covering having a pronounced relief made by the method of any one of claims 1 to 4 or with the apparatus of claims 5 to 8.